Honoring Elmer V. McCollum, Ph.D.

for
FORTY-SIX YEARS OF
PUBLIC HEALTH SERVICE
for
THE PEOPLE OF KANSAS

and
THE WORLD

K.P.H.A. Bay

K.P.H.A. Banquet Kansas City, Kansas May 6, 1952



ELMER V. McCOLLUM, Ph. D.

HONORING DOCTOR McCOLLUM

In tribute to his unflagging efforts in nutritional studies and research, Doctor E. V. McCollum is our guest of honor on the occasion of the Tenth Annual Meeting of the Kansas Public Health Association on May 5, 6, 7, 1952 at Kansas City, Kansas.

Through Doctor McCollum's pioneering research in the science of nutrition and especially in the chemistry and clinical effect of vitamins, he has contributed much to the health of untold millions of people. The new knowledge which he has carefully, methodically and scientifically unearthed has significantly improved the knowledge of nutrition. This knowledge has been put to practice all over the globe to effectively prevent dietary deficiencies in large and important segments of the population and has also been used in the specific treatment and cure of many persons who suffered from nutritional deficiencies.

Not Kansans alone — but all the people of the world have reason to be grateful and to honor Doctor McCollum — for such is his stature.

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Doctor McCollum, for your discovery of Vitamins A, B, and D; for your discovery of the importance of the trace elements; for the profound influence you have exerted upon the sciences of biochemistry and nutrition; for your unselfish counsel to the many national and international organizations devoted to

the promotion of public health; for your stimulus and example to students; for the millions of lives you have saved or strengthened; we, the members of the Kansas Public Health Association, present to you the Samuel J. Crumbine Award as a token of esteem and honor.

Mr. Lewis W. Andrews, President Mr. Homer F. Davis, President-elect H. Wallace Lane, M.D., Vice-President Miss Evelyn Ford, Secretary-Treasurer and

The Executive Committee

In addition to the officers, the Executive Committee includes: Miss Pearl Rorabaugh; Mr. Chas. Billings; Thos. R. Hood, M.D.; Mr. Frank Victor; Mrs. Flora Kelley; Mr. Wilbur Palmer; Vernon M. Winkle, M.D.

ELMER V. McCOLLUM, Ph.D. Emeritus Professor of Biochemistry, Johns Hopkins School of Hygiene and Public Health Baltimore, Maryland

Elmer V. McCollum was born near Fort Scott, Kansas, March 3, 1879. Plain-spoken and forceful, he will always bear the imprint of the Kansas Pioneer. Gripped with an intense desire to learn the truth, his enthusiasm for research kindles a like spirit in his students. Yet he has never been one to shy away from the painful task of pointing out mistaken "facts." Where lesser men would have hedged, he has always adhered to the truth as he saw it. A lank, but rugged individualist of Scotch descent, standing six feet one inch, and weighing 170 pounds, he leads and others follow.

Life has not always been pleasant. Father Cornelius McCollum, tuberculous when mustered out of the Union Army at Fort Scott, Kansas, did not have an easy time raising a family of five children on his 160 acres of raw land ten miles west of Fort Scott. Frontier life was rough and tough, and poverty, ignorance and mal-nutrition abounded. With the help of his brother he did manage to build a ten by twenty-foot, sod-roofed, stone "house," containing two rooms and a shed. Here in this leaky, stone soddy, Mother McCollum, with only a skillet, cooked for her family of four children. When Elmer was but six months old, she found herself pregnant again! He would have to be weaned.

The old saying, "Cow's milk kills!" was true in those days (1879); one could rake the scum from the

strainer with a fingernail. But placed on a diet of boiled milk and mashed potatoes, Elmer gradually lost his vigor, becoming a thin, pale baby who was always crying. His skin bore many black-and-blue spots, his legs became swollen, his gums angry red, puffed and bleeding; his teeth didn't come through. He had scurvy; But, no one knew it. No one knew what to do. As each month went by he gradually became worse and worse, until finally when baby brother was born, Elmer had almost been given up as hopeless. Then, one day as Mother McCollum was peeling apples for pies, she scraped some of the fruit and gave it to the unhappy, fretful baby on her lap. He ate it avidly and stopped crying. From that day on, throughout the winter, he had scraped apples. With this addition to his meals he began to quiet down, and to improve no iceably. So it was when spring came with fresh vegetables and fruits from the garden and more healthful meals he was still alive. The first crisis was over.

Neither Father nor Mother McCollum had had much schooling, but Father would read whenever he had an opportunity, and Mother was particularly anxious that the children be well educated. She'd had but two winters of school herself, but she could read. Education was hard to come by in those pioneer days and, what little there was, often wasn't too good. It was perhaps with this in mind that the family eventually moved to Lawrence. Elmer was now ready for high school, but high school was only for those who could pass the district examinations. These he could not pass. "Pop" Olney, principal of the Lawrence High School, with a sagacity far greater than he ever knew, finally consented to let young McCollum enroll

with the provision that he might stay in school only if he did exceptionally good work. He did, and another crisis was passed!

From then on Elmer V. McCollum began to move forward rapidly as though guided toward a definite goal. After graduation from high school, he took two degrees (A.B., M.S.) in four years at the University of Kansas. With \$82 in his pocket he set forth for Yale. By tutoring wealthy Eastern boys and by winning the much coveted Loomis Award for excellence in chemistry, he left Yale two years later with a Ph.D. and \$1500.

As a young chemistry instructor at the University of Wisconsin working under the famous Stephen M. Babcock (Babcock test for butterfat revolutionized the dairy industry), it was natural that his research would be concerned with the nutrition of dairy cattle. A third crisis arose when Doctor McCollum turned to rats as a much better animal than the cow for laboratory work. In Wisconsin, this was heresy! Even the Dean forbade their use for fear the tax-payers would find it out. Public money must not be spent to feed rats. But, let Doctor McCollum tell it as he told it recently to Russell Lord. (1)

"One Sunday morning in 1907 when I was completely discouraged and bewildered and wondering what to do next, Dr. Babcock came into my lab. You know how it was in those days: You were supposed to mix up rations from so much of carbohydrate, so much of protein and fat and so on, and then would get a certain effect.

"Only, it wouldn't. With the courage of youth and ignorance, I'd been wading through a mountain of work, analyzing feeds and flesh and milk and manure to no good purpose. Nothing proved out. There must be some unknown factors in the equation. But what?

"Already the analytic chemists had listed more than a quarter-million possible organic compounds. With as many as that, I asked Dr. Babcock, how could we ever hit upon food combinations that proved out in the feedlot or on the table? Why not start at the other end—go from the complex to the simple? Instead of prescribing food combinations ask the animals. And not the barnyard animals; ask rats; because rats are small enough to allow you to do a lot of exact chemical work on the small amounts of food you put before them. Therefore you can have a precise knowledge of what's in that food.

"Dr. Babcock said: 'That's the best suggestion I ever heard! Let's see the Dean. I was just there. He's in his office.'

"The good Dean, H. L. Russell, was startled to see us so excited on a quiet Sunday morning. Dr. Babcock rushed in. I was only a second behind him, still taking my laboratory apron off. A kind man, Dean Russell heard us out, then gave us a grave little lecture about public opinion and rats. 'Our work must be with practical animals,' he said.

"We went away crestfallen, all the wind out of our sails. But next morning Dr. Babcock stopped by at my lab again. 'That really was a fertile idea,' he mused. Then he was silent. I kept right on blowing into my water-bottle as if I hadn't heard. Then: 'I believe I'd do it anyway! Let's see Hart,' said Babcock.

 [&]quot;The Newer Knowledge of Nutrition" by Elmer V. Mc-Collum; Russell Lord's "The Land" Volume VIII No. 1, P. 79 1949.

E. B. Hart was head of my section. We saw him, and he said to go ahead, but try not to make a fuss. Babcock's influence was something to be reckoned with. When the College wanted anything badly they would ask him to make one of his quiet little speeches to the legislature, and it would always work.

"So I caught seventeen wild rats down by the horse barns and, old Mutch, the college carpenter, made two cages for them for \$15 that would cost \$125 now. I started feeding tests on them and Babcock came by to help me watch them every day. Those barn rats were too wild and nervous for our purposes. So we gave them up and bought twelve albino rats from a pet store.

"One day a little lame girl named Marguerite Davis came in to see me. A fine spirit; the head of home economics sent her. Her father was a retired professor of botany. She'd graduated from Barkeley and wanted something to do. 'Let me take care of your rats,' she said. I tried to get her some money, but couldn't. She stayed on the job six years, and I got her \$600 the last year. She was the co-discoverer of the first vitamin—Vitamin A."

The beneficial results from using rats as the test animal have been enormous. Vitamin A was discovered in 1912; soon Doctor McCollum also recorded the need in animals for a water soluble nutrient later known as vitamin B; during this time he developed the first adequate working hypothesis of a proper diet; and, also devised a technique for the biological analysis of a foodstuff.

Recognition came now, and with it the position as Head of the Department of Biochemistry, School of Hygiene and Public Health, Johns Hopkins University. In the years that followed, Doctor McCollum and his associates revealed the relationships of dietary calcium and phosphorus to normal skeletal development; discovered vitamin D; developed a biological test for assay of anti-rachitic products; discovered the first chemical method for determining vitamin B1; showed the nutritional indispensability of magnesium, sodium and potassium; did pioneer investigations on the importance of the trace elements aluminum, manganese, fluorine, zinc, nickel, cobalt and boron. More recently, Doctor McCollum has been studying the possibilities of separation of the chromatogenic fractionation of several amino acids.

With honor came many demands for consultation. That he unselfishly placed his skills and knowledge at the service of humanity, is shown by the organizations with which he has worked:

1917-1919	Scientific Advisory Administration.	Committee,	Hoover	Food
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1921 Food and Nutrition Board, National Research Council.

1928-1937 Consultant, Bureau of Animal Industry.

1931 Vital Standards Committee (International) London.

1931 Delegate, Eighth International Dairy Conference, Copenhagen, Denmark.

1932-1949 United States Pharmacopeia Vitamin Advisory Board.

1933-1937 National Advisory Health Council.

1935 Permanent Commission of Nutrition, League of Nations (London).

1936-1937 Mixed Commission on Nutrition of the Health Section of the League of Nations (Geneva).

1937 Conference of Technical Experts Commission, League of Nations (London).

1937	Collaborator, Bureau of Animal Industry.		
1938	Consultant, National Institute of Health.		
1938	Chairman, Nutrition Section, Tenth Pan- American Sanitary Conference. (Bogota, Columbia).		
1939	Chairman, Nutrition Section, Pan-American Bureau.		
1941	Chairman, Section on Research of National Conference on Nutrition in Defense.		
1941	Chairman, Advisory Committee, Coordinator of Information on Food and Nutrition.		
1941	Scientific Advisory Committee of Nutrition Foundation.		
1942	Subcommittee, Emergency Research Committee on Foods and Nutrition, National Research Council.		
1943	Consultant, Lend-Lease Administration.		
1943	Consultant, Industrial Hygiene Division, United States Army.		
1947	Chairman, Scientific Advisory Committee, The Robert Gould Research Foundation.		
1948	Advisory Committee of the McCollum-Pratt Institute for the Study of Trace Elements in plant and animal economy.		

He is the author of several books on nutrition; and the list of his research publications is ten pages in length. His research papers when bound fill four thick volumes. He was asked to give and gave the following noted lectures:

1917 Harvey Lecture Series.

1919 Cutter Lectures (Harvard University).

1937 Beaumont Foundation Lectures (Wayne University).

Bi-Centennial Lectures (University of Pennsylvania).
 Harben Lecture (University of Toronto).

1948 Remsen Memorial Lecture (Johns Hopkins University).

He is a member of:

Alpha Chi Sigma. American Public Health Association. American Association for the Advancement of Science.

American Association of University Professors.

American Chemical Society.

American Institute of Nutrition.

American Philosophical Society.

American Society of Biological Chemists.

International Association of Dental Research.

National Academy of Sciences.

Dr. McCollum's tireless energy, devotion to research, and to dissemination of knowledge have not gone unrewarded. In recognition of his innumerable contributions he has been made an honorary member of:

The Harvey Society.
Des Moines Academy of Medicine.
New York Academy of Dentistry.
Royal Academy of Medicine of Belgium.
Royal Institute of Public Health and Hygiene (London).
Kaiserlich Deutsche Academie der Naturforchser Zu Halle.
Swedish Academy of Sciences.
Royal Academy of Arts and Sciences (London).
Phi Beta Kappa.
Sigma Xi.

He has received:

- 1920 Sc.D. (honorary) University of Cincinnati.
- 1921 Howard N. Potts Gold Medal, Franklin Institute.
- 1924 John Scott Medal, City of Philadelphia.
- 1927 Newell Sill Jenkins Medal, Connecticut State Dental Society.
- 1934 Gold Medal, American Institute of New York.
- 1935 Callahan Medal, Ohio State Dental Society.
- 1937 LL.D. (honorary) University of Manitoba.
- 1937 Citation, University of Kansas (for reflecting honor on the State and on the University).
- 1938 Award, Associated Grocery Manufacturers of America, Inc.
- 1940 Modern Pioneers Award, National Association of Manufacturers.

- 1941 Sculptured Portrait, Rochester Academy of Medicine, Medical Museum, Hall of Fame (The 24 men who have made the most fundamental discoveries in the medical sciences in North America in 150 years. Doctor McCollum is one of the two non-medical men included).
- 1944 Borden Award.
- 1948 McCollum-Pratt Fund set up by Mr. John Lee Pratt, a Trustee of Johns Hopkins University, \$500,000 to finance a ten year research program on the trace elements. (Organized as the Mc-Collum-Pratt Institute in 1949).
- 1951 LL.D. (honorary) Johns Hopkins University.
- 1951 Fourth Annual Symposium, Robert Gould Research Foundation, on: "The Physiologic Role of Certain Vitamins and Trace Elements" was in honor of Doctor McCollum.

Doctor McCollum has five children and nine grandchildren. Mrs. McCollum is an active faculty member of the Department of Biochemistry, Johns Hopkins School of Hygiene and Public Health. She has worked many years at his side, helping discover vitamin D, and unraveling many of the threads of nutritional knowledge.

The years have grayed his hair and dimmed his hearing, but his imagination and his memory are still sharper than the bite of a Kansas plow.

As Elsa Orent-Keiles, long an associate of Doctor McCollum, says, "A man's scientific achievement is the combined result of his scientific ability and his character. Few have enjoyed a life of such intense and long continued scientific activity as he. His fertile imagination, breadth of vision, research enthusiasm, unswerving forward look, and wide interests have given rise to a variety of important investigations for which he is recognized as one of the outstanding leaders in American science."